PROGRESS REPORT NO. 7

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[redacted]

Approved For Release 2001/08/13 : CIA-RDP78B04747A001800150012-4

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[redacted]

21 SEPTEMBER 1959

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[redacted]

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IN COMPLIANCE WITH THE REQUIREMENTS OF SCHEDULE A, ARTICLE 2, ITEM 5, CONTRACT NO. [redacted], WE HEREWITH SUBMIT MONTHLY PROGRESS REPORT NO. 7. THIS REPORT COVERS THE PERIOD FROM 9 AUGUST 1959 TO 9 SEPTEMBER 1959 ON THE DESIGN AND FABRICATION OF THREE (3) NADIR DETERMINING DEVICES.

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DURING THE RECENT VISIT TO [redacted] AND [redacted] ON 31 AUGUST 1959, THE FOLLOWING MATTERS WERE DISCUSSED:

1. IT WAS REQUESTED THAT WE INVESTIGATE CHANGING THE PIGMI UNITS FROM FIVE (5) DIGIT COUNTERS TO SIX (6) DIGIT COUNTERS FOR USE WHEN TAKING LARGE MEASUREMENTS BY "LEAP-FROGGING". A SEPARATE LETTER WILL BE SUBMITTED BY 28 SEPTEMBER ON THE ANTICIPATED COSTS OF THIS MODIFICATION.

2. THE FOLLOWING INFORMATION CONCERNING THIS SYSTEM WAS REQUESTED, AND IS PROVIDED HEREWITH:

A.	WEIGHT OF COMPLETE SYSTEM	2,000 LBS.
B.	HEAT DISSIPATION	16,000 BTU/HR.
C.	MINIMUM FLOOR AREA FOR THE SYSTEM	40 SQUARE FEET (L = 9', W = 4 1/2' APPROX.)
D.	POWER REQUIREMENTS	115 VAC, 60 CYCLE, 40 AMPS.
E.	CUBATURE OF LARGEST ITEM	100 CUBIC FEET (L = 82", W = 34", H = 62")

3. THE REQUESTED PRELIMINARY DRAFT OF OPERATING INSTRUCTIONS FOR THE NADIR DETERMINING DEVICE IS AT ENCLOSURE 1. THE CONTROL PANEL ARRANGMENT IS SUBJECT TO CHANGE; HOWEVER, IT SHOULD PROVIDE ADEQUATE PRELIMINARY OPERATIONAL INFORMATION.

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4. IT WAS AGREED THAT [redacted] WOULD NOT PROVIDE A CHAIR FOR THE OPERATOR; RATHER, THAT THE CUSTOMER WOULD UTILIZE A GFE CHAIR, WITH ARMS, SIMILAR TO THAT SHOWN IN THE SKETCH FOLLOWING THE TITLE PAGE OF PROGRESS REPORT NO. 6.

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5. WE REQUESTED THAT VIBRATION MEASUREMENTS BE TAKEN IN THE AREA WHERE THE NADIR DETERMINING DEVICE IS TO BE USED, TO INCLUDE FREQUENCY AND AMPLITUDE DURING A TYPICAL WORKING DAY. FROM THESE, WE WILL DETERMINE IF VIBRATION ISOLATORS ARE NECESSARY.

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6. [redacted] HAS BEEN CONTACTED AND WILL VISIT [redacted] ON 15 SEPTEMBER 1959 TO ASSURE COMPLETE COORDINATION OF BOTH OUR EFFORTS.

7. OUR MANAGER, FIELD ENGINEERING, [redacted] WILL CONTACT YOU IN THE NEAR FUTURE REGARDING A SERVICE PROGRAM FOR THE NADIR DETERMINING DEVICE. ILLEGIB

8. THE EDGES OF THE GLASS IN THE FILM HOLDER ASSEMBLY ARE BEING REPOLISHED TO PROVIDE AN ABSOLUTE SCRATCH-FREE SURFACE.

9. CONCERNING THE INTENT OF MESSRS. [redacted] TO REVISIT [redacted] SOON, IT APPEARS THAT THE MIDDLE OF OCTOBER WOULD BE THE MOST PROFITABLE TIME. ILLEGIB
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A CURRENT PROGRESS CHART IS AT ENCLOSURE 2. WHILE SOME SLIPPAGE ON INDIVIDUAL COMPONENTS IS REFLECTED, FINAL DELIVERY OF THE FIRST UNIT IS STILL ANTICIPATED BY 30 NOVEMBER 1959. FILM STAGE ASSEMBLY DRAWINGS HAVE BEEN RELEASED FOR FABRICATION. ALL LONG LEAD ITEMS ARE ON ORDER, AND THE MORE DIFFICULT MACHINING OPERATIONS HAVE COMMENCED. THE DESIGN OF THE "X" AND "Y" DRIVES FOR THE MEASURING ENGINE ARE ESTIMATED 80 PER CENT COMPLETE. WE EXPECT TO HAVE THE FIRST OF THESE UNITS UNDER TEST BY THE FIRST OF OCTOBER 1959. THE SERVO AMPLIFIERS HAVE BEEN ORDERED FROM [redacted] THE HIGH GAIN ("X" DRIVE) NUMBER IS 2301-01-201, AND THE MEDIUM GAIN ("Y" DRIVE) NUMBER IS 2001-01. STATINTL
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THE LIGHT SOURCE ASSEMBLY DRAWING (ENCLOSURE 3) AND THE PHOTOMULTIPLIER HIGH VOLTAGE POWER SUPPLY DRAWING (ENCLOSURE 4) ARE IN DRAFTING AND WILL BE CHECKED AND RELEASED DURING THE NEXT REPORTING PERIOD. THE ELECTRICAL PORTION OF THE JOB WAS BEHIND SCHEDULE; HOWEVER, WE HAVE RECEIVED APPROVAL TO ENGAGE A JOB SHOP CONTRACT ENGINEER, WHICH WILL ALLEVIATE THIS SITUATION. IT IS ANTICIPATED THAT FINAL ASSEMBLY AND CHECK WILL BEGIN DURING THE FIRST WEEK IN OCTOBER, WHICH WILL ALLOW SOME TWO MONTHS FOR THIS PHASE.

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VERY TRULY YOURS,

[redacted]

SENIOR MECHANICAL ENGINEER

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ENCLOSURE (4)

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PRELIMINARY ROUGH DRAFT - OPERATION OF NADIR

[redacted]

15 September 1959

The operator turns on power by pushing Power key. Power indicator turns yellow indicating warm-up time (3 min.). This is to provide for warm-up of the High Voltage power supply, Indicator circuitry and Servo amplifiers. During this warm-up time, all controls are disabled.

At the end of the warm-up period, Power indicator switches from yellow to red, signifying that power is available. At the same time, indicator on Standby key lights (yellow). The machine is now in standby mode; that is, all electronic units requiring warm-up time are turned on (these units are the ones mentioned above), but all units that can be instantaneously turned on have no power. To operate the machine, the operator pushes Standby key. The Standby indicator turns from yellow to green showing that the machine is ready for operation. Operation of the Standby key turns on all remaining electrical units; these include the power consuming ones such as projector lamps (1000 W each). If it is desired not to use the machine temporarily, the operator pushes the Standby key. The Standby indicator turns from green to yellow. All high power consuming units are now disconnected. If the machine is to be completely turned off, the operator pushes Power key.

On the control panel is a key with indicator for Scanner ON-OFF. This key controls the power to scanner motor and scanner projector. This control is an alternate action switch and is normally ON. It has its indicators lit when in the ON position.

A typical mode of operation is as follows: When Power and Standby keys have been pushed, the operator then sets the fixed data on the fixed data switches above the viewing screen. He then presses the fixed data (FD) key on the keyboard and this information is read into the Readout unit and onto tape. Then the operator

ENCLOSURE 1

runs the desired film into the viewing screen from left to right with the film traverse control stick. He positions the film centrally on the viewing screen. Two speed ranges are available: one slow range for accurately positioning the film; and one fast speed range for quck indexing of film. These speed ranges may be mechanically set by the operator. The control stick can be moved right and left giving forward or reverse movement of the film. Within each speed range the film traverse speed is proportional to control stick deflection. He then determines if the frame shows a left or a right horizon, and pushes appropriate key on the keyboard. A left frame indicator (red) or a right frame indicator (green) will light. This command will also be read into the Readout unit and onto paper tape. Also, certain control functions of the servos will occur (switching of the fixed phase of the X servo motor). The operator is now ready to set the machine manually on the first fiducial mark. He pushes Fast Speed key; and Fast Speed indicator will light up. The high speed servo gears are now engaged. With the universal servo control stick he now moves the frame image until the fiducial mark approximately coincides with the crosshair on the screen. (NOTE: In order to energize the servo drive, he must keep the button on top of the control stick pressed down.) The operator now pushes Slow Speed key. The Fast Speed indicator goes out and the Slow Speed indicator lights up. The operator can now accurately position the fiducial mark on the crosshair. (NOTE: Interlocks are provided to prevent operation of the servos when neither of the speed indicators is lit.)

If it is required to use the first fiducial mark as a zero reference, the operator pushes the X and Y origin set keys (2 keys). This operation will zero the counters in the Readout unit.

In order to read out the coordinates of a fiducial mark on paper tape, the operator pushes a Readout key.

When all fiducial marks have been recorded, the operator manually moves the frame with the control stick until the bottom end of the interface coincides with the crosshair. By observing the Scanner Indicating Tuning Bar above the screen, he can determine when he is close to the interface.

The phosphorous columns of the tuning bar normally meet in the center of the tuning bar. However, when the interface approaches the crosshair, the columns suddenly open up indicating that the error detector circuitry is now operating. Further approaching of the interface toward the crosshair will slowly move the tuning bar columns toward each other until they meet, indicating that the interface position is reached.

When the operator notes that the tuning bar opens up, he knows that he can engage the automatic X servo mode. He pushes Automatic Set Mode key and the Automatic Set Mode indicator light up.

The machine then automatically locks the interface on the crosshair. The operator now pushes the Automatic Tracking and Readout key. This key lights up. The Y servo is now energized and the frame moves in a negative Y direction. After one-second intervals, the Y servo drive stops and an automatic readout of the X and Y coordinates is caused. This sequence is repeated until a preset number of 10 to 20 points is read out. At this time, the Automatic Tracking and Readout Mode is automatically stopped. In addition, the Automatic Set Mode is released. If it is desired to stop the Automatic Tracking and Readout Mode or the Automatic Set Mode at any other time, a second push on either of these buttons will be required. An interlock is provided to prevent operation of the Automatic Tracking and Readout Mode unless the Automatic Set Mode key has been operated.

Two keys are provided for error indication. One key will enter a Delete Last Reading code on the tape output. The other key will enter a Delete Last Frame code on the tape output.

On the control panel are two keys also, to reverse signs of X or Y readout.

A keyboard is provided on the control panel for entering, besides the already mentioned Left Frame, Right Frame and Fixed Data command, the digits 0-9 Plus and Minus sign and End Tape command. The End Tape command serves to indicate that a sequence of readings have been completed.

A brightness control for the viewing screen image is provided on the control panel. A special key is provided for multiple measurement of film (Leap Frogging).

On the front panel are also located fuse indicators to notify the operator if certain non-obvious internal component breakdowns occur.

When the readings of one frame have been completed, the operator runs a new frame into viewing position with the film traverse control stick. The engagement of the film drive motor provides a control signal to extinguish the Left or Right Frame indicator light. This control signal also serves to provide a control command to the X servo to position the measuring engine centrally in X.

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